Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (currently amended) An apparatus allowing for the dynamic allocation of network resources among a plurality of users, comprising

a partition object space, defined in a computer-readable memory, storing a plurality of partition objects; the plurality of partition objects including at least one dynamic partition object having at least one attribute defining a first allocation of network bandwidth ~~a network resource~~ across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining user partition allocations of the network bandwidth ~~network resource~~ within the first allocation, wherein the user partition allocations are each less than the first allocation; and at least one user partition object having at least one attribute defining an allocation of the network bandwidth ~~network resource~~ across all data flows corresponding to a user;

a partition management module operative to access the partition object space in the computer-readable memory and to:

select partition objects based on one or more attributes of data flows;

identify new users based on at least one packet attribute of packets in the data flows;

when a dynamic partition object is selected, dynamically create a user partition object in the partition object space in response to an identification of a new user, wherein the dynamically created user partition object is a child of a selected

dynamic partition object and includes an allocation of the network bandwidth ~~network resource~~ according to the second attribute of the selected dynamic partition object, and

a partitioning mechanism operably connected to a communication path for transmitting data packets corresponding to ~~between the network resource and~~ a plurality of respective users,

wherein the partitioning mechanism is operative to:

associate users with corresponding user partition objects, and

enforce the respective network bandwidth ~~network resource~~ allocations defined in the dynamic and user partition objects.

2. (original) The apparatus of claim 1 wherein the partition management module is further operative to delete inactive user partition objects from the partition object space.

3. (previously amended) The apparatus of claim 2 wherein the partition management module is operative to reclaim user partition objects from the partition object space as required for new users.

4. (original) The apparatus of claim 2 wherein an inactive user partition object is identified in relation to a threshold period of inactivity.

5. (original) The apparatus of claim 3 wherein an inactive user partition object is identified in relation to a threshold period of inactivity.

6. (canceled)

7. (previously amended) The apparatus of claim 1 wherein each dynamic partition object is associated with a characteristic of the data packets transmitted in the communication path, wherein the partition management module is operative to identify the dynamic partition object associated with a data packet and create a corresponding user partition object.

8. (currently amended) An apparatus allowing for the dynamic allocation of network resources among a plurality of users, wherein the network resources and the users are operably connected to a computer network, comprising

a partition object space, defined in a computer-readable memory, storing a plurality of partition objects; the plurality of partition objects including at least one dynamic partition object and at least one user partition object;

a traffic class database storing traffic classes in association with corresponding dynamic partition objects;

wherein the at least one dynamic partition object has at least one attribute defining a first allocation of a network resource to a corresponding traffic class and at least one attribute defining a second allocation, within the first allocation, of the network resource across all data flows corresponding to a user;

wherein the at least one user partition object has at least one attribute defining an allocation of the network resource to a user;

a partitioning mechanism operably connected to the computer network to receive and transmit data flows, the partitioning mechanism further operative to:

identify a new data flow and the traffic class associated with the <u>new</u> data

flow; and,

a partition management module operative to <u>access the partition object space in</u>

<u>the computer-readable memory and</u>, in response to [[a]] <u>the</u> new data flow<u>, to</u>:

identify the dynamic partition object associated with the traffic class of the

new data flow;

identify a new user based on one or more attributes of at least one packet

of the <u>new</u> data flow;

dynamically create a user partition object <u>as a child of the identified</u>

<u>dynamic partition object</u> in the partition object space in response to an

identification of a new user according to the <u>at least one attribute</u>

~~attributes~~ of the <u>identified</u> dynamic partition object ~~associated with the~~

~~new data flow~~;

return the user partition object to the partitioning mechanism;

wherein the partitioning mechanism is further operative to enforce the

allocations defined in the user partition objects to control access to the network resource

among a plurality of users.

9. (original) The apparatus of claim 8 wherein the partition management module is

further operable to reclaim inactive partition objects from the partition object space.

10. (currently amended) An apparatus operable to dynamically allocate access to a

network resource among a plurality of users, comprising:

<u>a computer-readable memory supporting a finite number of partition objects;</u>

a partition management module operative to access the computer-readable memory and to:

identify new users based on at least one attribute of packets in data flows; dynamically create user partition objects in [[a]] the memory space supporting a finite number of partition objects, in response to the new users, wherein the memory space comprises a plurality of partition objects including at least one dynamic partition object having at least one attribute defining a first allocation of a network resource across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining allocations of the network resource within the first allocation;

wherein the dynamically-created user partition object is a child partition of the dynamic partition object and defines a partition including the second attribute of the dynamic partition object for managing aggregate bandwidth across all data flows corresponding to a given user; and,

a partitioning mechanism operative to enforce the partitions defined in the partition objects to control access to the network resource among a plurality of users.

11. (currently amended) A computer-implemented method allowing for dynamic allocation of network bandwidth a network resource, the method comprising the steps of:

recognizing a new user of a network resource based on one or more attributes of at least one packet in a data flow;

accessing a memory space comprising a plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of network bandwidth a network resource across all data flows corresponding to the at

least one dynamic partition <u>object</u>, and a second attribute defining user partition allocations of the <u>network bandwidth</u> ~~network resource~~ within the first allocation;

    <u>selecting a partition object from the plurality of partition objects based on one or more attributes of the data flow; and</u>

    <u>if the selected partition object is the dynamic partition object,</u> creating a user partition object <u>as a child of the dynamic partition object</u> on demand for the new user, wherein the user partition object is operable to allocate utilization of the <u>network bandwidth</u> ~~network resource~~, according to the second attribute defined in the dynamic partition object, across all data flows corresponding to the new user; and,

    disposing of the user partition object when no longer needed.

12. (previously amended) The method of claim 11 wherein the disposing step comprises the steps of

    reclaiming the user partition object for a subsequent new user if the user partition object is inactive.

13. (previously amended) The method of claim 11 further comprising

    receiving a set of parameters defining the dynamic partition object.

14. (currently amended) The method of claim 11 wherein the user partition object is configurable based on a characteristic of the user's utilization of the <u>network bandwidth</u> ~~network resource~~.

15. (currently amended) The method of claim 11 wherein the user partition object is

operable to provide a minimum allocation of the <u>network bandwidth</u> ~~network resource~~ to the new user.

16. (currently amended) The method of claim 11 wherein the user partition object is operable to limit utilization of the <u>network bandwidth</u> ~~network resource~~.

17. (previously amended) The method of claim 11 wherein the user partition object is implemented by class-based weighted fair queuing functionality.

18. (previously amended) The method of claim 11 wherein the user partition object is implemented by committed access rate functionality.

19. (canceled)

20. (currently amended) A computer-implemented method allowing for dynamic allocation of network resources, the method comprising the steps of

<u>receiving a set of parameters defining the dynamic partition object and a partition cap parameter defining a desired limit on the number of user partitions;</u>

recognizing new users of a network resource based on one or more attributes of at least one packet in a data flow;

accessing a memory space comprising a plurality of partition objects arranged in a hierarchical partition configuration, the plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of a network resource across all data flows corresponding to the dynamic partition <u>object</u>,

and a second attribute defining user partition allocations of the network resource within
the first allocation;

if a number of existing user partitions does not exceed the partition cap, creating
user ~~partitions~~ partition objects on demand for new users, wherein each user partition
object is a child ~~partition~~ of a corresponding dynamic partition object and operable to
allocate utilization of the network resource, according to the user partition allocation
defined by the second attribute, across all data flows corresponding to a user; and,

reclaiming inactive user ~~partitions~~ partition objects for subsequent new users.

21. (previously amended) The method of claim 20 wherein inactive user partitions are
reclaimed when necessary for subsequent new users.

22. (previously amended) The method of claim 20 wherein inactive user partitions are
reclaimed automatically.

23. (canceled)

24. (currently amended) The method of claim [[23]] 20 further comprising the steps of
receiving a set of parameters defining an overflow partition, wherein the
overflow partition defines an aggregate allocation of the network resource for data
flows associated with users assigned to the overflow partition; and
automatically assigning new users to the overflow partition, if the number of
user partitions exceeds the partition cap.

25. (currently amended) A computer-implemented method allowing for dynamic allocation of network resources, the method comprising the steps of

recognizing new users of a network resource based on one or more attributes of at least one packet in corresponding data flows;

accessing a partition object space comprising a plurality of partition objects arranged in a hierarchical partition configuration, the plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of a network resource across all data flows corresponding to the at least one dynamic partition object, and a second attribute defining user partition allocations of the network resource within the first allocation;

selecting partition objects from the plurality of partition objects based on one or more attributes of the data flow; and

for selected partition object that are dynamic partition objects, dynamically creating user partition objects in the partition object space on demand for the new users, wherein each user partition object is a child partition of the corresponding dynamic partition object and includes the second attribute;

enforcing the allocations defined in the dynamic and user partition objects on data flows traversing a network path;

monitoring use of the user partition objects; and,

reclaiming inactive user partition objects in the partition object space for subsequent new users, as needed.

26. (currently amended) A computer-implemented method facilitating the dynamic allocation of network resources, the method comprising the steps of:

recognizing a new user based on one or more attributes of at least one packet in a data flow;

associating a traffic classification to the data flow;

accessing a partition object space comprising a plurality of partition objects arranged in a hierarchical partition configuration, the plurality of partition objects including a dynamic partition object having at least one attribute defining a first allocation of a network resource and a second attribute defining user partition allocations of the network resource within the first allocation;

identifying a dynamic partition object based on the traffic classification associated with the data flow;

creating a user partition object as a child of the dynamic partition object on demand for the new user, wherein the user partition object includes an allocation of the network resource for all data flows corresponding to the new user according to the user partition allocation defined by the second attribute of the identified dynamic partition object;

associating the user partition object with the data flow; and,

disposing of the user partition object when no longer needed.

27. (previously amended) The method of claim 26 wherein the disposing step comprises

reclaiming the user partition object for a subsequent new user.